

**2-09 STRUCTURE EXCAVATION****2-09.1 Description**

Structure excavation consists of excavating and disposing of all natural material or man-made objects that must be removed to make way for bridge foundations, retaining walls, culverts, trenches for pipelines, conduits, and other Structures as shown in the Plans.

This Work also includes, unless the Contract provides otherwise, removing whole or partial Structures, grubbing Structure sites that would not otherwise be grubbed, building and later removing shoring, cofferdams, or caissons, pumping or draining excavated areas, protecting excavated materials from the weather, and placing and compacting backfill.

**2-09.2 Materials**

Materials shall meet the requirements of the following sections:

Portland Cement	9-01
Fine Aggregate for Portland Cement Concrete	9-03.1(2)
Admixture for Concrete	9-23.6
Fly Ash	9-23.9
Ground Granulated Blast Furnace Slag	9-23.10
Water	9-25

**2-09.3 Construction Requirements****2-09.3(1) General Requirements**

All Structure excavation, trenching, and shoring shall be performed in strict compliance with Chapter 296-155 WAC as well as all other applicable local, Contracting Agency, and Federal laws and regulations.

**2-09.3(1)A Staking, Cross-Sectioning, and Inspecting**

The Contractor shall not begin excavating until after the stakes have been set to locate and/or outline the Structure and taken cross-sections to determine how much material to remove. The Engineer will occasionally inspect material taken from and material remaining in the excavation.

**2-09.3(1)B Depth of Excavation**

The Contractor shall excavate foundation pits to the depth the Plans require, or to any revised depth ordered by the Engineer.

**2-09.3(1)C Removal of Unstable Base Material**

When the material at the bottom of an excavation is not stable enough to support the Structure, the Contractor shall excavate below grade and replace the unstable material with gravel backfill.

Gravel backfill shall meet the requirements of [Section 9-03.12](#). It shall be placed in layers not more than 6-inches thick with each layer compacted to 95-percent of the maximum density determined by the Compaction Control Test, [Section 2-03.3\(14\)D](#).

**2-09.3(1)D Disposal of Excavated Material**

The Engineer may direct the Contractor to dispose of excavated material in embankments, backfills, or remove it from the site.

All costs for disposing of excavated material within the project limits shall be included in the unit Contract price for Structure excavation, Class A or B. If, however, the Contractor must load and haul the material to a disposal site, the Contracting Agency will pay as provided in [Section 1-04.4](#) for loading and hauling. The Contracting Agency will not pay for handling at the disposal site. Any such disposal shall meet the requirements of [Section 2-03.3\(7\)C](#).

If the Contract includes Structure excavation, Class A or B, including haul, the unit Contract price shall include all costs for loading and hauling the material the full required distance.

**2-09.3(1)E Backfilling**

The backfilling of openings dug for Structures shall be a necessary part of and incidental to the excavation. Unless the Engineer directs otherwise, backfill material shall be nonclay material containing no pieces more than 3-inches across, no frozen lumps, and no wood or other foreign material.

When specified in the Contract or when approved by the Engineer, the Contractor shall supply controlled density fill as backfill material.

**Alternative Sources.** When material from Structure excavation is unsuitable for use as backfill, the Engineer may require the Contractor to:

1. use other material covered by the Contract if such substitution involves Work that does not differ materially from what would otherwise have been required;
2. substitute selected material in accordance with [Section 2-03.3\(10\)](#);
3. use Controlled Density Fill (CDF) also known as Controlled Low Strength Material (CLSM)), or;
4. obtain material elsewhere. Material obtained elsewhere will be paid for in accordance with [Section 1-04.4](#).

**Controlled Density Fill (CDF) or Controlled Low-Strength Material (CLSM).**

CDF is a self compacting, cementitious, flowable material requiring no subsequent vibration or tamping to achieve consolidation. The Contractor shall provide a mix design in writing to the Engineer on WSDOT Form 350-040 and utilize ACI 229 as a guide to develop the CDF mix design. No CDF shall be placed until the Engineer has reviewed the mix design. CDF shall be designed to have a minimum 28-day strength of 50 psi and a maximum 28-day strength not to exceed 300-psi. The CDF consistency shall be flowable (approximate slump 3 to 10-inches).

The following testing methods shall be used by the Contractor to develop the CDF mix design:

- 28-day compressive strength - ASTM D 4832,
- Unit weight, yield, and air content - ASTM D 6023,
- Slump - WSDOT FOP for AASHTO T 119.

The water/cement ratio shall be calculated on the total weight of cementitious material. The following are considered cementitious materials: Portland cement, fly ash, ground granulated blast furnace slag and microsilica fume.

Admixtures used in CDF shall meet the requirements of [Section 9-23.6](#), Admixtures for Concrete, and foaming agents, if used, shall meet the requirements of ASTM C 869. Admixtures shall be used in accordance with the manufacturer's recommendations and non-chloride accelerating admixtures may be used to accelerate the hardening of CDF.

CDF shall meet the requirement of Section 6-02.3(5)C and shall be accepted based on a Certificate of Compliance. The producer shall provide a Certificate of Compliance for each truckload of CDF in accordance with Section 6-02.(5)B.

**Stockpiling.** The Engineer may require the Contractor to selectively remove and stockpile any usable material excavated for a Structure. If this material meets the requirements for gravel backfill for walls it may replace gravel as wall or abutment backfill.

If the Contractor stockpiles excavated material for use as backfill, it shall be protected with plastic sheeting or by some other method from contamination and weather damage. If the material becomes too wet or contaminated in the stockpile, the Contractor shall dispose of and replace it with an equal amount of suitable material, all at no expense to the Contracting Agency. All costs for storing, protecting, rehandling, and placing stockpiled material shall be included in the unit Contract price for Structure excavation, Class A or B.

**Compaction.** Backfill from Structure excavation shall be placed and compacted in keeping with the following requirements:

1. Backfill supporting Roadbed, Roadway embankments, or Structures, including backfill providing lateral support for noise barrier wall foundations, luminaire poles, traffic signal standards, and roadside and overhead sign Structure foundations shall be placed in horizontal layers no more than 6-inches thick with each layer compacted to 95-percent of the maximum density determined by the Compaction Control Test according to [Section 2-03.3\(14\)D](#).
2. Gravel backfill for drains shall be placed in horizontal layers no more than 12-inches thick, with each layer compacted by at least three passes of a vibratory compactor approved by the Engineer.
3. All other structure excavation backfill shall be placed in layers no more than 2-feet thick (loose), with each layer tamped and graded so that final settling will leave the backfill flush with surrounding ground.
4. Compaction of controlled density fill will not be required.

**Timing.** Backfill shall not be placed against any concrete Structure until the concrete has attained 90-percent of its design strength and a minimum age of 14-days, except that reinforced concrete retaining walls 15-feet in height or less may be backfilled after the wall has attained 90-percent of its design compressive strength and curing requirements of [Section 6-02.3\(11\)](#) are met. Footings and columns may be backfilled as soon as forms have been removed, so long as the backfill is brought up evenly on all sides.

The Engineer may order the Contractor to use lean concrete in backfilling around piers and in front of abutments and walls. The Contracting Agency will pay for such backfilling as provided in [Section 1-04.4](#).

If water prevents the Contractor from properly placing and compacting backfill, it shall be removed by pumping or other means.

All costs not defined in this section that relate to providing, placing, and compacting backfill shall be at the Contractor's expense.

**2-09.3(1)F Items to Remain**

If the Contractor damages or removes pavement or anything else meant to remain outside the excavation area, it shall be repaired or replaced at no expense to the Contracting Agency.

**2-09.3(2) Classification of Structure Excavation**

1. **Class A.** Structure excavation required for bridge and retaining wall footings, pile caps, seals, and wingwalls shall be classified as Structure excavation Class A. If the excavation requires a cofferdam, structural shoring, or extra excavation, the work outside the neat lines of the Structure excavation Class A shall be classified as shoring or extra excavation Class A.
2. **Class B.** All other Structure excavation shall be Class B. If this excavation requires cofferdams, shoring, or extra excavation, the work outside the neat lines of the Structure excavation Class B shall be classified as shoring or extra excavation Class B.

**2-09.3(3) Construction Requirements, Structure Excavation, Class A****2-09.3(3)A Preservation of Channel**

When foundations or Substructures are to be built in or next to running streams, the Contractor shall:

1. Excavate inside cofferdams, caissons, or sheet piling unless dredging or open pit excavation is permitted.
2. Backfill foundations placed inside cofferdams and behind sheet piling prior to removing cofferdams or sheet piling. This backfill shall be level with the original streambed and shall prevent scouring.
3. Remove any excavation material that may have been deposited in or near the stream so that the watercourse is free from obstruction.
4. Maintain water depth and horizontal clearances required for traffic to pass on navigable streams, furnishing any channel signals or lights required during construction.
5. Place riprap around the outside of cofferdams, as specified, to repair local scour.

**2-09.3(3)B Excavation Using Open Pits — Extra Excavation**

The Contractor may dig open pits or perform extra excavation without shoring or cofferdams, if:

1. Footings can be placed in dry material away from running water.
2. The integrity of the completed Structure and its surroundings is not reduced.
3. Worker safety is ensured as required by law.
4. The excavation does not disturb the existing pavement or any other adjacent structural elements.

If a slide occurs in an open pit, the Contractor shall remove the slide material. If the slide disturbs an area over which a Highway will be built, the Contractor shall backfill and compact the site to the original ground line as approved by the Engineer. If the slide damages an existing facility such as a Roadway or Structure, the Contractor shall repair the damage caused by the slide. The Contractor shall pay all costs related to removing slide material and restoring the slide area, including the repair of any pavement or structural elements damaged by the slide.

The Contractor shall drain or pump any water from the pit, taking care not to stir up or soften the bottom. If equipment in the pit or inadequate water removal makes the foundation material unstable, the Contractor shall, at no expense to the Contracting Agency, remove and replace it with material the Engineer approves.

When the Engineer believes ground water flow may impair a concrete footing, the Contractor shall place under it a layer of gravel at least 6-inches thick. Before placing the gravel, the Contractor shall excavate to whatever grade the Engineer requires. This provision shall not apply to the building of concrete seals.

The Contractor may omit forms when the earthen sides of a footing excavation will stand vertically. In this case, the Contractor may excavate to the neat line dimensions of the footing and pour concrete against the undisturbed earth. If the hole is larger than neat line dimensions, the Contractor shall bear the cost of the extra concrete.

For open temporary cuts, the following requirements shall be met:

1. No vehicular or construction traffic, or construction surcharge loads will be allowed within a distance of 5-feet from the top of the cut.
2. Exposed soil along the slope shall be protected from surface erosion.
3. Construction activities shall be scheduled so that the length of time the temporary cut is left open is reduced to the extent practical.
4. Surface water shall be diverted away from the excavation.

**Submittals and Design Requirements.** The Contractor shall submit Working Drawings and calculations showing the geometry and construction sequencing of the proposed excavation slopes. The Contractor shall not begin excavation operations until receiving the Engineer's approval of the excavation submittal.

The excavation stability design shall be conducted in accordance with the WSDOT *Geotechnical Design Manual* (M46-03). The stability of the excavation slopes shall be designed for site specific conditions which shall be shown and described in the Working Drawings. Examples of such items that shall be shown on the excavation submittal and supported by calculations include, but are not limited to, the following:

1. Excavation geometry and controlling cross sections showing adjacent existing foundations, utilities, site constraints, and any surcharge loading conditions that could affect the stability of the slope;
2. A summary clearly describing subsurface soil and groundwater conditions, sequencing considerations, and governing assumptions;
3. Any supplemental subsurface explorations made to meet the requirements for geotechnical design of excavation slopes, in accordance with the WSDOT *Geotechnical Design Manual*;
4. Supporting geotechnical calculations used to design the excavation, the soil and material properties selected for design, and the justification for the selection for those properties, in accordance with the WSDOT *Geotechnical Design Manual*;
5. Safety factors, or load and resistance factors used, and justification for their selection, in accordance with the WSDOT *Geotechnical Design Manual*, and referenced AASHTO design manuals;
6. Location and weight of construction equipment adjacent to the excavation top, and location of adjacent traffic; and,
7. A monitoring plan to evaluate the excavation performance throughout its design life.



**2-09.3(3)C Preparation for Placing Foundations**

When a foundation will rest on rock, excavation shall penetrate it at least 1-foot, or more if the Plans require, to form a key for the footing. The Contractor shall cut the bottom of the excavation to a firm surface, level, stepped, or serrated as the Engineer directs, and remove all loose material.

For an arch abutment, the back face shall be trimmed to true lines so that concrete can be poured against undisturbed material.

If concrete will rest on any excavated surface other than solid rock, the Contractor shall not disturb the bottom of the excavation. The Contractor shall also remove all loose or soft material just before pouring the concrete.

Upon completing any foundation excavation, the Contractor shall notify the Engineer. No concrete or other permanent part of the Structure may be placed until the Engineer has given permission to proceed.

**2-09.3(3)D Shoring and Cofferdams**

**Definitions.** Structural shoring is defined as a shoring system that is installed prior to excavation. Structural shoring shall provide lateral support of soils and limit lateral movement of soils supporting Structures, Roadways, utilities, railroads, etc., such that these items are not damaged as a result of the lateral movement of the supporting soils.

Structural shoring systems includes driven cantilever sheet piles, sheet piles with tiebacks, sheet pile cofferdams with wale rings or struts, prestressed spud piles, cantilever soldier piles with lagging, soldier piles with lagging and tiebacks, and multiple tier tieback systems.

Trench boxes, sliding trench shields, jacked shores, shoring systems that are installed after excavation, and soldier pile, sheet pile, or similar shoring walls installed in front of a pre-excavated slope, are not allowed as structural shoring.

A cofferdam is any watertight enclosure, sealed at the bottom and designed for the dewatering operation, that surrounds the excavated area of a Structure. The Contractor shall use steel sheet pile or interlocking steel pile cofferdams in all excavation that is under water or affected by ground water.

**Submittals and Design Requirements.** The Contractor shall submit Working Drawings and calculations showing the proposed methods and construction details of structural shoring or cofferdams in accordance with Sections 6-01.9 and 6-02.3(16). The Contractor shall not begin construction of structural shoring or cofferdams, nor begin excavation operations, until approval of the structural shoring submittal has been given by the Project Engineer.

Structural shoring and cofferdams shall be designed for conditions stated in this Section using methods shown in Division I Section 5 of the AASHTO *Standard Specifications for Highway Bridges* Seventeenth Edition - 2002 for allowable stress design, or the AASHTO *LFRD Bridge Design Specifications*, Third Edition, 2004 and current interims for load and resistance factor design. The USS Steel Sheet Piling *Design Manuals*, published by United States Steel, may be used for shoring walls that do not support other Structures and that are 15-feet in height or less. Allowable stresses for materials shall not exceed stresses and conditions allowed by Section 6-02.3(17)B. The shoring design shall also be in compliance with the WSDOT *Geotechnical Design Manual* (M46-03). In the case of conflict or discrepancy between manuals, the *Geotechnical Design Manual* shall govern.

For open temporary cuts associated with a shoring system, the requirements for open temporary cuts specified in [Section 2-09.3\(3\)B](#) shall be met.

The structural shoring system shall be designed for site specific conditions which shall be shown and described in the Working Drawings. The structural shoring system design shall include the design of the slopes for stability above and below the shoring system. Except as otherwise noted, the design height of all structural shoring in design calculations and Working Drawings shall be for the depth of excavation as required by the Plans, plus an additional 2-feet to account for the possibility of overexcavation. If the Contractor provides written documentation to the satisfaction of the Engineer that the soil conditions at the site are not likely to require overexcavation, the Engineer may waive the requirement for 2-feet of overexcavation design height.

Examples of such items that shall be shown on the structural shoring submittal and supported by calculations include, but are not limited to, the following:

1. Heights; soil slopes; soil benches; and controlling cross sections showing adjacent existing foundations, utilities, site constraints, and any surcharge loading conditions that could affect the stability of the shoring system, including any slopes above or below the shoring.
2. A summary clearly describing performance objectives, subsurface soil and groundwater conditions, sequencing considerations, and governing assumptions.
3. Any supplemental subsurface explorations made to meet the requirements for geotechnical design of excavation slopes, shoring walls, and other means of ground support, in accordance with the *WSDOT Geotechnical Design Manual*.
4. Supporting geotechnical calculations used to design the shoring system, including the stability evaluation of the shoring system in its completed form as well as intermediate shoring system construction stages, the soil and material properties selected for design, and the justification for the selection for those properties, in accordance with the *WSDOT Geotechnical Design Manual*.
5. Safety factors, or load and resistance factors used, and justification for their selection.
6. Location and weight of construction equipment adjacent to the excavation; location of adjacent traffic; and structural shoring system material properties, spacing, size, connection details, weld sizes, and embedment depths.
7. Structural shoring installation and construction sequence, procedure, length of time for procedure and time between operations; proof load testing procedure if any; deadman anchor design and geometry; no load zones; grouting material and strengths; and a list of all assumptions.
8. Methods and materials to be used to fill voids behind lagging, when soldier piles with lagging are used as structural shoring.
9. A monitoring/testing plan to evaluate the performance of the excavation/shoring system throughout its design life, and
10. An estimate of expected displacements or vibrations, threshold limits that would trigger remedial actions, and a list of potential remedial actions should thresholds be exceeded. Thresholds shall be established to prevent damage to adjacent facilities, as well as degradation of the soil properties due to deformation.

**Construction Requirements.** Structural shoring or cofferdams shall be provided for all excavations near completed Structures (foundations of bridges, walls, or buildings), near utilities, and near railroads.

All other excavations 4-feet or more in depth shall either be shored with structural shoring or cofferdams, or shall meet the open-pit requirements of [Section 2-09.3\(3\)B](#).

Existing foundations shall be supported with structural shoring if the excavation is within the limits defined by a plane which extends out from the nearest edge of the existing footing a level distance of  $\frac{1}{2}$  the width of the existing footing and then down a slope of 1.5:1.

When structural shoring or cofferdams are utilized, all excavation and structural shoring shall be constructed in accordance with the approved structural shoring submittal, including any required construction sequence noted in the Working Drawings. The Contractor shall remain responsible for satisfactory results.

If soldier piles are placed in drilled holes, then the hole shall be filled to the top of the soldier pile either with controlled density fill, if water is not present in the hole, or lean concrete. Backfilling soldier pile drilled holes with pea gravel or sand is not allowed.

If lagging is used, void space behind the lagging shall be minimized. If the Engineer determines that the voids present could result in damage or serviceability problems for the structural shoring system or any Structures or facilities adjacent to the structural shoring system, the Contractor shall cease excavation and lagging installation, and shall fill the voids specified by the Engineer in accordance with the approved structural shoring submittal. Further excavation and lagging placement shall not continue until the specified voids are filled to the satisfaction of the Engineer.

Excavation shall not proceed ahead of lagging installation by more than 4-feet or by the height that the soil will safely stand, whichever is least. For tieback shoring systems, excavation shall not proceed ahead by more than 4-feet of the tie installation and proof testing.

In using cofferdams or structural shoring, the Contractor shall:

1. Extend cofferdams well below the bottom of the excavation, and embed structural shoring as shown in the structural shoring submittal as approved by the Engineer.
2. Provide enough clearance for constructing forms, inspecting concrete exteriors, and pumping water that collects outside the forms. If cofferdams tilt or move laterally during placement, the Contractor, at no expense to the Contracting Agency, shall straighten or enlarge them to provide the required clearance.
3. Secure the cofferdam in place to prevent tipping or movement.
4. Place structural shoring or cofferdams so that they will not interfere with any pile driving required.
5. Not place any shoring, braces, or kickers inside the cofferdams and structural shoring that will induce stress, shock, or vibration to the permanent Structure.
6. Vent cofferdams at the elevation commensurate with seal weight design, or as shown in the Plans.
7. Remove all bracing extending into the concrete being placed.



When the Work is completed, the Contractor shall:

1. Remove all structural shoring to at least 2-feet below the finished ground line.
2. Remove all cofferdams to the natural bed of the waterway.

#### **2-09.3(3)E Bearing Tests**

The Engineer may stop the excavation to make bearing tests at any time. The Contractor shall assist with these tests in any way the Engineer requires.

During any test period, the Contractor shall, at no expense to the Contracting Agency, maintain ordinary working conditions at the bottom of the hole. The Contracting Agency will pay force account for all labor and materials the Contractor supplies for such tests. A single test shall not exceed 72-hours.

#### **2-09.3(4) Construction Requirements, Structure Excavation, Class B**

The above requirements for Structure excavation Class A, shall apply also to Structure excavation Class B, except as revised below. In addition, the Contractor shall follow Division 7 of these Specifications as it applies to the specific kinds of Work.

The hole for any catch basin or manhole shall provide at least 1-foot of clearance between outside structural surfaces and the undisturbed earth bank.

If workers enter any trench or other excavation 4-feet or more in depth that does not meet the open pit requirements of [Section 2-09.3\(3\)B](#), it shall be shored or other safety method constructed in conformance with WISHA requirements. The Contractor alone shall be responsible for worker safety and the Contracting Agency assumes no responsibility.

The Contractor must submit six sets of plans before shoring. These must meet the plan requirements set forth in [Section 2-09.3\(3\)D](#).

Trench boxes may be used for Structure excavation, Class B. Approval of trench boxes can be done by the Project Engineer provided it is not used to support adjacent traffic, existing footings, or other Structures. The Contractor shall submit three sets of the manufacturer's certified trench box plans containing Professional Engineer's stamp and seal, depth restrictions, and serial number for field verification of trench box.

Upon completing the Work, the Contractor shall remove all shoring unless the Plans or the Engineer direct otherwise.

#### **2-09.4 Measurement**

Excavated materials will be measured in their original position by the cubic yard. The Contracting Agency will measure and pay for only the material excavated from inside the limits this section defines. If the Contractor excavates outside these limits or performs extra excavation as described in [Section 2-09.3\(3\)B](#), it shall be considered for the Contractor's benefit and shall be included in the cost of other Bid items.

**Horizontal Limits.** The Contracting Agency will use the sides of the trench or pit as horizontal limits in measuring excavation. No payment for Structure excavation will be made for material removed (1) more than 1-foot outside the perimeter of any pile cap, footing, or seal, (2) more than 3-feet beyond the Roadway side of a wing wall, and (3) more than 1-foot beyond the other sides and end of a wing wall.

For all pipes, pipe arches, structural plate pipes, and underpasses, the Structure excavation quantity will be calculated based on the following trench widths:

For drain and underdrain pipes, trench width = I.D. + 12-inches.

For pipes 15-inches and under, trench width = I.D. + 30-inches.

For pipes 18-inches and over, trench width = (1.5 x I.D.) + 18-inches.

For a manhole, catch basin, grate inlet, or drop inlet, the limits will be 1-foot outside the perimeter of the Structure.

For drywells, the limits shall be in accordance with the Standard Plans.

**Lower Limits.** For a pile cap, footing, or seal, the bottom elevation shown in the Plans, or set by the Engineer, will serve as the lower limit in measuring Structure excavation. For a wing wall, the lower limit will follow a line parallel to the bottom and 1-foot below it. Any swell from pile driving will be excluded from excavation quantities.

For pipelines the bottom outside of the pipe will serve as the lower limit for measuring excavation. The Engineer may set another limit when excavation must be made below grade.

**Upper Limits.** The top surface of the ground or streambed as the Work begins will be the upper limit for measuring excavation. If the Contract, or a separate contract, includes a pay item for grading to remove materials, the upper limit will be the neat lines of the grading section shown in the Plans.

The Engineer may order the Contractor to partially build the embankment before placing pipe. In this case, the upper limit for measurement will be not more than 4-feet above the invert of the pipe. For a structural plate pipe, pipe arch, or underpass, the upper limit will be the top of the embankment at the time of installation as specified in [Section 7-03.3\(1\)A](#).

**Gravel Backfill.** Gravel backfill, except when used as bedding for culvert, storm sewer, sanitary sewer, manholes, and catch basins, will be measured by the cubic yard in place determined by the neat lines required by the Plans.

**Shoring or Extra Excavation.** No specific unit of measurement shall apply to the lump sum item of shoring or extra excavation Class A. Shoring or extra excavation Class B will be measured by the square foot as follows:

The area for payment will be one vertical plane measured along the centerline of the trench, including Structures. Measurement will be made from the existing ground line to the bottom of the excavation and for the length of the Work actually performed. If the Contract includes a pay item for grading to remove materials, the upper limit for measurement will be the neat lines of the grading section shown in the Plans. The bottom elevation for measurement will be the bottom of the excavation as shown in the Plans or as otherwise established by the Engineer.

Controlled density fill will be measured by the cubic yard for the quantity of material placed per the producer's invoice.

**2-09.5 Payment**

Payment will be made in accordance with [Section 1-04.1](#), for the following Bid items when they are included in the Proposal:

“Structure Excavation Class A”, per cubic yard.

“Structure Excavation Class B”, per cubic yard.

“Structure Excavation Class A Incl. Haul”, per cubic yard.

“Structure Excavation Class B Incl. Haul”, per cubic yard.

Payment for reconstruction of surfacing and paving within the limits of Structure excavation will be at the applicable unit prices for the items involved.

If the Engineer orders the Contractor to excavate below the elevations shown in the Plans, the unit Contract price per cubic yard for “Structure Excavation Class A or B” will apply. But if the Contractor excavates deeper than the Plans or the Engineer requires, the Contracting Agency will not pay for material removed from below the required elevations. In this case, the Contractor, at no expense to the Contracting Agency, shall replace such material with concrete or other material the Engineer approves.

“Shoring or Extra Excavation Cl. A \_\_\_\_\_”, lump sum.

When extra excavation is used in lieu of constructing the shoring, cofferdam or caisson, the lump sum Contract price shall be full pay for all excavation, backfill, compaction, and other Work required. If select backfill material is required for backfilling within the limits of Structure excavation, it shall also be required as backfill material for the extra excavation at the Contractor’s expense.

If it is necessary to place riprap outside of cofferdams to repair local scour, it shall be paid by agreed price or force account.

If the Engineer requires shoring, cofferdams, or caissons when the Contract provides no Bid item for such Work, the Contracting Agency will pay as provided in [Section 1-04.4](#).

If the Engineer requires the Contractor to build shoring or extra excavation Class A that extends below the elevation shown in the Plans, the Contracting Agency will pay the lump sum price and no more when the extra depth does not exceed 3-feet. For depths greater than 3-feet below the elevations shown, payment will be as provided in [Section 1-04.4](#).

“Shoring or Extra Excavation Class B”, per square foot.

The unit Contract price per square foot shall be full pay for all excavation, backfill, compaction, and other Work required when extra excavation is used in lieu of constructing shoring. If select backfill material is required for backfilling within the limits of the Structure excavation, it shall also be required as backfill material for the extra excavation at the Contractor’s expense.

If there is no Bid item for shoring or extra excavation Class B on a square foot basis and the nature of the excavation is such that shoring or extra excavation is required as determined by the Engineer, payment to the Contractor for the Work will be made in accordance with [Section 1-04.4](#).

“Gravel Backfill (\_\_\_\_\_)”, per cubic yard.

“Controlled Density Fill”, per cubic yard.